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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Michael Sharratt

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8237

7590

03/10/2005

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EXAMINER

KIM, DAVID S

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/780,683

Applicant(s)

SHARRATT ET AL.

Examiner

David S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 43-45, 47-58 and 60-68 is/are rejected.
- 7) ☒ Claim(s) 46 and 59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

- (claim 53 and 66) each path is operative for bidirectionally guiding the respective radiation therealong, and wherein the interfacing means is operative for communicating said at least one component guided in either direction of the first path along either direction of the second path.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 43-44, 48, 54, 56-57, 61, and 67** are rejected under 35 U.S.C. 102(e) as being anticipated by Fatehi et al. (U.S. Patent No. 6,067,389, hereinafter "Fatehi").

Regarding claim 43, Fatehi discloses:

An optical communication system, comprising:

a) a first optical path (e.g., fibers 106, 125, 108 in Fig. 1) for guiding information-bearing, first optical radiation partitioned into a plurality of wavebands;

b) a second optical path (e.g., fibers 107, 126, 109) for guiding information-bearing, second optical radiation partitioned into the same plurality of wavebands; and

c) switchable interfacing means (optical switch 100) for selectively communicating at least one component of the first radiation corresponding to a selected waveband from the first path to the second path, the interfacing means including

i) switchable waveband selective diverting means (fiber gratings 105A together with switches 121-122) in the first path, for selecting and diverting said at least one component of the first radiation corresponding to said selected waveband from the first path to an entry point (entry point into fiber 109) in the second path for guidance away from the entry point along the second path, and

ii) switchable waveband selective attenuating means (fiber gratings 105B together with switches 121-122) in the second path upstream of the entry point, for selectively blocking at least one component of the second radiation corresponding to said selected waveband (col. 4, l. 58-65).

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Regarding claim 44, Fatehi discloses:

The system of claim 43, wherein the interfacing means includes waveband selective coupling means (circulator 101) for selecting and coupling at least one component from the first radiation diverted by the diverting means to the entry point.

Regarding claim 48, Fatehi discloses:

The system of claim 44, wherein the diverting means, the attenuating means and the coupling means operate on the optical radiation in the optical domain (the corresponding means in Fatehi all operate on the optical radiation in the optical domain).

Regarding claim 54, Fatehi discloses:

The system of claim 43, wherein each path includes a plurality of subpaths (note multiple fiber links in each path).

Regarding claims 56-57, 61, and 67, claims 56, 57, 61, and 67 are apparatus claims that correspond to system claims 43, 44, 48, and 54, respectively. Therefore, the recited means in system claims 43-44, 48, and 54 read on the corresponding means in apparatus claims 56-57, 61, and 67.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 45, 47, 58, and 60** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fatehi as applied to claims 43-44 and 56-57 above, and further in view of Amundson et al. (U.S. Patent No. 6,285,812 B1, hereinafter "Amundson").

Regarding claim 45, Fatehi discloses:

The system of claim 43, wherein the diverting means includes waveband selective filtering means (e.g., fiber gratings 105A) for spatially separating components of the first radiation.

Fatehi does not expressly disclose:

wherein the diverting means also includes liquid crystal attenuation means associated with each component of the first radiation for selectively transmitting or diverting said at least one component of the first radiation corresponding to said selected waveband.

Rather, Fatehi broadly discloses the diverting means comprising tunable fiber gratings 105 (col. 3, l. 60-66). However, tunable fiber gratings that employ liquid crystal material are known in the art, as shown by Amundson. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ the tunable fiber grating teachings of Amundson in the system of Fatehi. One of ordinary skill in the art would have been motivated to do this since Amundson teaches further details on an exemplary tunable fiber grating. Such informative details are lacking in Fatehi. These details provide further instruction about an exemplary tunable fiber grating, instruction that would be necessary to one of ordinary skill in the art to operate and produce the tunable fiber grating.

Regarding claim 47, Fatehi discloses:

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The system of claim 44, wherein the attenuating means includes waveband selective filtering means (e.g., fiber gratings 105B) for spatially separating components of the second radiation.

Fatehi does not expressly disclose:

wherein the attenuating means also includes liquid crystal attenuating means associated with each component of the second radiation for selectively transmitting or diverting the components of the second radiation relative to the second path.

Rather, Fatehi broadly discloses the attenuating means comprising tunable fiber gratings 105 (col. 3, l. 60-66). However, tunable fiber gratings that employ liquid crystal material are known in the art, as shown by Amundson. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ the tunable fiber grating teachings of Amundson in the system of Fatehi. One of ordinary skill in the art would have been motivated to do this since Amundson teaches further details on an exemplary tunable fiber grating. Such informative details are lacking in Fatehi. These details provide further instruction about an exemplary tunable fiber grating, instruction that would be necessary to one of ordinary skill in the art to operate and produce the tunable fiber grating.

Regarding claims 58 and 60, claims 58 and 60 are apparatus claims that correspond to system claims 45 and 47, respectively. Therefore, the recited means in system claims 45 and 47 read on the corresponding means in apparatus claims 58 and 60.

7. **Claims 49-51 and 62-64** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fatehi as applied to claims 44 and 57 above, and further in view of Bononi et al. ("Analysis of hot-potato optical networks with wavelength conversion").

Regarding claim 49, Fatehi discloses:

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The system of claim 44, wherein the coupling means includes waveband switching means (note the general switch of a waveband on 106 to 109 in Fig. 1) for transferring information conveyed on a first set of components (components on 127) of the radiation diverted by the diverting means to a second set of components (components on 109) for guidance along the second path.

Fatehi does not expressly disclose:

the first set and the second set having different wavebands.

However, waveband switching means that convert a first set of components/wavebands of into a second set of differing components/wavebands are extremely well known in the art. A common term for such means is "wavelength converters." Bononi et al. teaches the conversion of the wavelength of a signal into a different wavelength (Bononi et al., whole document). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement wavelength converters as part of the waveband switching means of Fatehi. One of ordinary skill in the art would have been motivated to do this for the conventional benefit of wavelength converters: to prevent wavelength blocking and contention (Bononi et al., p. 525, col. 2) in the second path of Fatehi.

Regarding claim 50, Fatehi in view of Bononi et al. discloses:

The system of claim 49, wherein the switching means includes waveband selecting means (circulator 101) for isolating a component of a selected waveband in the first radiation diverted from the first path, detecting means (Bononi et al., PD in Fig. 3) for converting the isolated component into an electrical signal, and an optical radiation source (Bononi et al., OTX in Fig. 3) modulated by the signal for generating radiation bearing the signal at a waveband different (Bononi et al., p. 527, section B) from the selected waveband for guidance along the second path.

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Regarding claim 51, Fatehi in view of Bononi et al. discloses:

The system of claim 49, wherein the switching means includes waveband selecting means (circulator 101) for isolating a component of a selected waveband in the first radiation diverted from the first path, and an optical radiation source (Bononi et al., OTX in Fig. 3).

Fatehi in view of Bononi et al. does not expressly disclose:

said optical radiation source being biased substantially at its lasing threshold and stimulated by the isolated component, for generating a stimulated component modulated by information carried by the isolated component at a waveband different from the selected waveband for guidance along the second path.

However, Examiner takes Official Notice that this limitation is another common technique for providing wavelength conversion. Similar to the other means of Bononi et al., this limitation provides the same general benefit of the wavelength conversion means of Bononi et al. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement this limitation as part of the waveband selecting means of Fatehi in view of Bononi et al. One of ordinary skill in the art would have been motivated to do this for the conventional benefit of wavelength converters: to prevent wavelength blocking and contention (Bononi et al., p. 525, col. 2) in the second path of Fatehi.

Regarding claims 62-64, claims 62, 63, and 64 are apparatus claims that correspond to system claims 49, 50, and 51, respectively. Therefore, the recited means in system claims 49-51 read on the corresponding means in apparatus claims 62-64.

8. **Claims 52-53 and 65-66** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fatehi as applied to claims 43-44 and 56-57 above, and further in view of Ramaswami et al. (*Optical Networks: A Practical Perspective*, hereinafter "Ramaswami").

Regarding claim 52, Fatehi does not expressly disclose:

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The system of claim 44, wherein the coupling means includes regenerating means for regenerating the radiation guided therethrough.

However, systems that include regenerating means for regenerating radiation guided therethrough are well known and common in the art. Ramaswami provides a description of standard regeneration means (p. 10-11). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate regeneration means in the system of Fatehi. One of ordinary skill in the art would have been motivated to do this since there are transmission situations where an optical signal "may not be able to remain in optical form all the way to its destination and may have to be regenerated in between" (Ramaswami et al., p. 10, last paragraph). If the optical signals of Fatehi have sufficiently deteriorated, the information they carry may not be recognizable without such regeneration.

Regarding claim 53, Fatehi discloses:

The system of claim 43, wherein each path is operative for bidirectionally (note that radiation in fibers 125 and 126 travels to and from circulators 101 and 102, respectively) guiding the respective radiation therealong.

Fatehi does not expressly disclose:

wherein the interfacing means is operative for communicating said at least one component guided in either direction of the first path for guidance along either direction of the second path.

However, bi-directional paths are extremely well known and common in the art. Ramaswami teaches bi-directional systems and discusses various considerations related to bi-directional systems (p. 505-507). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange the paths of Fatehi to incorporate bi-directional teachings so that the interfacing means is operative for communicating said at least

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one component guided in either direction of the first path for guidance along either direction of the second path. One of ordinary skill in the art would have been motivated to do this for a variety of reasons, such as gradual capacity increasing (Ramaswami, p. 505, item 1), no need for automatic protection switching protocol (Ramaswami, p. 505, item 4), better support for some ring systems (Ramaswami, p. 506, item 5), better support for some point-to-point systems (Ramaswami, p. 506, item 6), the ability to handle asymmetric traffic (Ramaswami, p. 506, item 7), and higher amplifier output powers per channel and more gain flatness (Ramaswami, p. 507, item 8).

Regarding claims 65-66, claims 65 and 66 are apparatus claims that correspond to system claims 52 and 53, respectively. Therefore, the recited means in system claims 52-53 read on the corresponding means in apparatus claims 65-66.

9. **Claims 55 and 68** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fatehi.

Regarding claim 55, Fatehi discloses:

The system of claim 43, wherein each path is operative for bidirectionally (note that radiation in fibers 125 and 126 travels to and from circulators 101 and 102, respectively) guiding the respective radiation therealong, and wherein the interfacing means is operative for communicating said at least one component guided in one direction (to the right in 106 in Fig. 1) of the first path for guidance along a direction (to the right in 109) of the second path.

Fatehi does not expressly disclose:

wherein the direction of the second path is *opposite* said direction of the first path.

However, notice the crossing of paths 127 and 128 in Fig. 1 of Fatehi. Another technically trivial variation is to switch the arrangement of the bottom half of optical switch 100 so that

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paths 127 and 128 are parallel instead of crossing. Such a variation would alter the direction of the second path so that it is opposite of said direction of the first path.

Regarding claim 68, claim 68 is an apparatus claim that corresponds to system claim 55. Therefore, the recited means in system claim 55 read on the corresponding means in apparatus claims 68.

Allowable Subject Matter

10. **Claims 46 and 59** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments, filed on 20 December 2004, with respect to claims 43-68 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments are based on the following newly introduced limitations to independent claims 43 and 56:

- switchable interfacing means/switchable interface
- switchable waveband selective diverting means
- switchable waveband selective attenuating means in the second path upstream of the entry point, for selectively blocking at least one component of the second radiation corresponding to said selected waveband.

Fatehi is applied to address these newly introduced limitations.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Duerksen is cited to show a related system/interface that employs switchable interfacing means, switchable waveband selective diverting means, and switchable waveband selective attenuating means. Feuer et al. is cited to show a related system/interface that employs switchable interfacing means and switchable waveband selective diverting means.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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